

WHAT IS CLAIMED IS:

1. A bit head retaining system, comprising:
 - a bit head having an upper end and a working face;
 - a driver sub having an internal opening in which the upper end of the bit head is axially movable; and
 - a retention sleeve having an internal opening in which at least a portion of the bit head above the working face and at least a portion of the driver sub are disposed, the retention sleeve being axially immovable relative to the bit head.
2. The bit head retaining system as set forth in claim 1, wherein the retention sleeve is axially movable relative to the driver sub.
3. The bit head retaining system as set forth in claim 1, wherein the retention sleeve is secured to the bit head by a retention arrangement.
4. The bit head retaining system as set forth in claim 3, wherein the retention arrangement includes an internal recess in the retention sleeve, an external recess in the bit head, and a retention member disposed in the internal recess and the external recess.
5. The bit head retaining system as set forth in claim 4, wherein the retention member is a split ring.
6. The bit head retaining system as set forth in claim 1, wherein the retention sleeve includes an internal flange and the driver sub includes an external flange that limit axial movement of the retention sleeve relative to the driver sub.
7. The bit head retaining system as set forth in claim 1, wherein the upper end of the bit head has external splines and the driver sub has internal splines that correspond to the external splines.

8. The bit head retaining system as set forth in claim 1, further comprising a piston case having an end portion with internal threads, and wherein the driver sub has external threads, the external threads of the driver sub mating with the internal threads of the end portion.

9. The bit head retaining system as set forth in claim 1, further comprising a piston case having an end portion, and wherein an end of the driver sub is secured to the end portion.

10. The bit head retaining system as set forth in claim 9, wherein the retention sleeve is axially movable relative to the driver sub.

11. The bit head retaining system as set forth in claim 9, wherein axial movement of the retention sleeve relative to the driver sub is limited by the piston case.

12. The bit head retaining system as set forth in claim 11, wherein a bottom end of the piston case limits axial movement of the retention sleeve, and further comprising a wear ring disposed at the bottom end of the piston case to prevent direct contact between the retention sleeve and the piston case.

13. The bit head retaining system as set forth in claim 9, wherein the end of the driver sub is secured inside the end portion.

14. The bit head retaining system as set forth in claim 9, wherein the retention sleeve covers a gap defined between the drive sub and the bit head.

15. A bit head retaining system, comprising:
a bit head having an upper end and a working face; and
a retention sleeve adapted to be connected to an end of a drill casing and having an internal opening in which at least a portion of the bit head above the working face is

disposed, the bit head being secured to the retention sleeve so as to be axially immovable relative to the retention sleeve.

16. The bit head retaining system as set forth in claim 15, wherein the retention sleeve includes an internal recess and the bit head includes an external recess, and the bit head is secured to the retention sleeve by a retention member disposed in the internal recess and the external recess.

17. The bit head retaining system as set forth in claim 16, wherein the retention member is a split ring.

18. The bit head retaining system as set forth in claim 15, wherein the retention sleeve includes an internal ledge for connecting the retention sleeve to the end of the drill casing.

19. The bit head retaining system as set forth in claim 15, wherein the bit head is rotationally movable relative to the retention sleeve.

20. A method of installing a bit head in a percussion drill, comprising:
inserting an upper end of a bit head into an internal axial opening at a first end of a driver sub;
sliding a retention sleeve over a second end of the driver sub until an internal recess in the retention sleeve aligns with an external recess in the bit head;
securing the bit head relative to the retention sleeve with a retention member disposed in the external recess in the bit head and in the internal recess in the retention sleeve; and
attaching the second end of the driver sub to a piston case.

21. The method as set forth in claim 20, wherein the retention member is a split ring.

22. The method as set forth in claim 20, wherein the bit head is secured relative to the retention sleeve so that the bit head is axially immovable relative to the retention sleeve.

23. The method as set forth in claim 22, wherein the bit head is secured relative to the retention sleeve so that the bit head is rotatable relative to the retention sleeve.